Amendments to the Specification:

Please amend the paragraph at Page 1 from line 7 as following:

The present invention generally relates to ~~provide~~ a heat sink device ~~for heat dissipation~~ applied for [[in]] an integrated circuit, and more particularly to a ~~ball grid~~ package ~~array~~ device with heat sink device to reduce the thermal resistance and to improve the thermal dissipation.

Please amend the paragraph at Page 1 from line 14 as following:

In the electronics and computer industries, it has been well known to employ various types of electronic [[device]] package[[s]] devices and integrated circuit chips, such as the PENTIUM central processing unit chip (CPU) that manufactured by Intel Corporation and RAM (random access memory) chips. These integrated circuit chips have a pin grid array (PGA) package and are typically installed into a socket, which is soldered to a computer circuit board. These integrated circuit device[[,]] particularly to the CPU microprocessor chips, generate a great deal [[off]] of heat during operation which must be removed to prevent the adverse effects [[on]] from operation of the PENTIUM microprocessor, containing millions of transistors, is highly susceptible to overheating which could destroy the microprocessor device itself or other components proximal to the microprocessor.

Please amend the paragraph at Page 2 from line 4 as following:

In addition to the above discussed microprocessors ~~discussed above~~, there are many ~~other~~

types of semiconductor ~~device~~ package[[s]] device, which [[are]] commonly used in computer equipment. For example, the resistors and thermistors generate large volumes of heat during normal operation and [[are]] also subject to failure if not cooled properly.

Please amend the paragraph at Page 2 from line 22 as following:

In similar [[,]] fashion to the earlier semiconductor devices discussed above, many different types of electronic devices suffer[[s]] from overheating. For example, any electronic ~~device~~ package device may have a threat of overheating. However, there are many types of electronic device that need cooling; however, the devices are too small to adequately support and receive the ~~typical~~ conventional metallic heat sink. These prior metallic heat sinks are commonly glued directly to the electronic device with a thermally conductive adhesive, or [[plant]] installed [[to]] into the electronic ~~device~~ package device with a mechanical structure, such as a spring clip. Further, the gap pads are often required to even out the interface surface to achieve ~~satisfactory~~ thermal dissipating efficiency ~~conductivity~~. In view of the foregoing issues related to these types of electronic components, providing heat dissipation in the form of heat sinks, and the like, are difficult and the cost is prohibitive.

Please amend the paragraph at Page 3 from line 22 as following:

~~Referring to~~ FIG. 1 and FIG. 2[[,]] show ~~the~~ a conventional ball grid array package device 100 with heat slug. The ball grid array package device with heat slug includes a ball grid array

substrate 102, a chip, or die 104 on the ball grid array substrate 102, and a modified heat slug 106 over the chip 104 and the ball grid array substrate 102. Then, a molding compound 108 is injected into the ball grid array package device 100 to ~~accomplish~~ perform the ball grid array package device manufacturing. ~~Regard~~ Referring to FIG. 2, the die or chip 104 is covered below the molding compound 108, the thermal conductivity of the molding compound 108 is too low to cause the heat dissipating ~~effect~~ efficiency that is limited by the heat dissipating path. The solution method [[is to]] added an embedded heat slug 108 onto the die or chip 104 to increase the heat dissipating area. Nevertheless, the defect of this technique is that the large volume of heat, which is generated by the die or chip 104[[,]] ~~so as to cause~~ Therefore, the chip or die 104 cannot be operated.

Please amend the paragraph at Page 4 from line 21 as following:

It is another object of this invention is to provide a conductive protruding block on the backside of the heat sink body to associate the cavity of the ball grid array package device [[of]] with modified embedded heat slug to improve the heat ~~conductivity~~ dissipating efficiency.

Please amend the paragraph at Page 5 from line 2 as following:

It is a further object of this invention is to provide at least two conductive ~~pillars~~ supports on the backsides of heat sink body to join the ~~opening~~ through holes of the bottom plate.

Please amend the paragraph at Page 5 from line 6 as following:

It is yet object of this invention is to provide a bottom plate to join the first ~~part of~~ the heat sink ~~assemblies~~ assembly with the at least two conductive ~~pillar~~ supports to contact with the backside of the [[PC]] printed circuit board to introduce the heat which is generated by the die or chip. [[that]] The heat can be removed from the backside of the [[PC]] printed circuit board through the bottom plate to the ~~at least~~ conductive ~~pillar~~ support of the first heat sink ~~assemblies~~ assembly to the heat ~~dissipating members~~ dissipating structure ~~thereon to remove the heat~~.

Please amend the paragraph at Page 5 from line 14 as following:

According to abovementioned objects, the present invention provides the heat sink device for the ~~modified embedded heat slug with~~ ball grid array package device with a modified embedded heat slug to improve the heat ~~dissipation~~ dissipating efficiency. The heat sink device is constructed of first ~~part of~~ heat sink assembly and the second ~~part of~~ heat sink assembly. The first ~~part of~~ heat sink assembly ~~comprises~~ includes a heat ~~dissipating element~~ dissipation that located above the heat sink body, and at least two conductive ~~pillars~~ supports that located below the two sides of the heat sink body, which is used to increase the heat dissipating area[[;]]. [[a]] A conductive protruding block located below the backside of the heat sink body, ~~wherein~~ and the conductive protruding block ~~used to~~ associated with the cavity of the ball grid array package device [[of]] with modified embedded heat slug to increase the heat ~~conductivity~~ dissipating efficiency. In addition, the second ~~part of~~ the heat sink assembly is a bottom plate, which includes the protruding [[part]] structure in

the central of the bottom plate, and at least two ~~opening~~ through holes on the sides of the bottom plate respectively[[,]]. ~~wherein~~ [[the]] The protruding [[part]] structure ~~is used to~~ contacted with the backside of the [[PC] printed circuit board, ~~so as to increase~~ therefore, the heat is generated die or chip that can be ~~heat dissipation to~~ removed [[the]] by the dissipation ~~heat that is generated die or chip~~, and to join the at least two conductive ~~pillars~~ supports of the heat sink body to fix first ~~part of~~ heat sink assembly, second ~~part of~~ heat sink assembly, and the ball grid array package device on the [[PC]] printed circuit board that between the first ~~part~~ heat sink assembly and second ~~part of~~ heat sink assembly.

Please amend the paragraph at Page 7 from line 4 as following:

FIG. 3 is a schematic ~~representation~~ view that shows the cross-sectional view of the structure of a first ~~part of~~ heat sink assembly that includes a heat sink body, a ~~heat-dissipating element~~ heat dissipation thereon, at least two conductive ~~pillars~~ supports located below [[the]] two sides of the heat sink body, and a conductive protruding block that located below the backside of the heat sink body in accordance with the device disclosed herein;

Please amend the paragraph at Page 7 from line 11 as following:

FIG.4 is a schematic ~~representation~~ view that shows the cross-sectional view of the thermal conductive adhesive tape spread overall the surface of backside of the heat sink body to fix and to increase the heat ~~dissipation~~ dissipating efficiency in accordance with the device disclosed herein;

Please amend the paragraph at Page 7 from line 16 as following:

FIG.5 is a schematic ~~representation~~ view that shows the cross-sectional view of the structure of the ball grid array package device with modified embedded heat slug on the [[PC]] printed circuit board in accordance with the device disclosed herein;

Please delete Page 7 from lines 21 through 24 as following:

~~FIG. 5 is a schematic representation the cross-sectional view of the thermal conductive adhesive tape spread overall the surface of backside of the heat sink body to increase the heat dissipation in accordance with the device disclosed herein;~~

Please amend the paragraph at Page 8 from line 1 as following:

FIG. 6 is a schematic ~~representation~~ view that shows the cross-sectional view of the structure of the second ~~part of~~ heat sink assembly in accordance with the device disclosed herein;

Please amend the paragraph at Page 8 from line 6 as following:

FIG. 7 is a schematic ~~representation~~ view that shows the cross-sectional view of the conductive ~~pillars~~ support of the heat sink body passed through the at least two through holes of the [[PC]] printed circuit board to fix the [[PC]] printed circuit board in accordance with the device disclosed herein; and

Please amend the paragraph at Page 8 from line 11as following:

FIG. 8 is a schematic ~~representation~~ view that shows the heat ~~transfer~~ dissipating is introduced from the [[PC]] printed circuit board to the heat sink assembly in accordance with the structure disclosed herein.

Please amend the paragraph at Page 8 from line 24 as following:

The present invention provides the ~~heat sink device for the ball grid array~~ package device with modified embedded heat slug ~~techniques~~ to reduce the thermal resistance and to increase the heat ~~dissipation~~ dissipating capability. The package device can be a ball grid array package device. [[The]] FIG. 3 through FIG. 7 ~~showing~~ shows the structure, function, and the relationship there-between of the heat sink device, and FIG. 8 represents the heat-dissipating path [[that]] according to the heat sink device as provided in the present invention ~~provided~~. FIG. 3 represents the structure of the first ~~part of the~~ heat sink assembly 1A, which ~~comprises~~ includes a first heat dissipating structure 2 and a second heat dissipating structure 4. ~~element as a heat sink body 2, that having a~~ The second heat dissipating ~~element~~ structure 4, such as a heat dissipating fin located on the first heat dissipating structure 2. ~~thereon that~~ The second heat dissipating structure 4 [[is]] used [[to]] for ~~increase~~ increasing the heat dissipating area to improve the heat ~~dissipation~~ dissipating efficiency. ~~; and at~~ At least two conductive ~~pillars~~ supports 6 located on the backside of the first heat dissipating ~~element~~ structure 2 that is ~~used to connect~~ connected with the ~~ball grid array~~ package device with modified embedded heat slug on the ~~PC (printed circuit)~~ board (as shown in FIG. 5),

and [[to]] is connected with the second ~~part of the~~ heat sink assembly (as shown in FIG. 4).

Please amend the paragraph at Page 9 from line 17 as following:

The key feature of the present invention is that the first heat dissipating ~~element~~ structure 2 is made of conductive material such as metal, and is formed by casting, ~~such that~~ therefore, the heat dissipating [[effect]] efficiency would be improved. Another key feature of the present invention is that at least two conductive ~~pillars~~ supports 6 located on the backside of the first heat dissipating ~~element~~ structure 2 that ~~takes place~~ replaced the conventional plastic ~~pillars~~ supports on the backside of the first heat dissipating ~~element~~ structure 2 to increase the heat dissipating [[effect]] efficiency.

Please amend the paragraph at Page 10 from line 2 as following:

~~As referring~~ Referring to FIG. 3, the first heat-dissipating ~~element~~ structure 2 further ~~comprises~~ includes a conductive protruding block 8 on the backside of first heat dissipating ~~element~~ structure 2. The conductive protruding block 8 ~~used to~~ contacts with the cavity 24 of the ~~ball grid array~~ package device with modified embedded heat slug to increase the heat ~~dissipation~~ dissipating efficiency, when the large number of heat is generated during operating integrated circuit ~~is operated to generate a large of heat in the computer~~. In an alternative preferred embodiment, the thermal conductive adhesive tape 10 is spread overall the surface of backside of the first heat [[-]] dissipating ~~element~~ structure 2 (as shown in FIG. 4) that is used to contact with the surface of the molding compound 26 of the [[BGA]] package device and to introduce the heat conductivity to increase the

heat dissipation [[effect]] efficiency.

Please amend the paragraph at Page 10 from line 15 as following:

~~Another~~ FIG. 4 shows another alternative embodiment of the present invention[[,]]. ~~as shown in FIG. 4,~~ [[the]] The thermal conductive adhesive tape 10 [[are]] located on the backside of the first heat dissipating ~~element~~ structure 2, wherein the thermal conductive adhesive tape 10 is spread around the backside of the first heat dissipating ~~element~~ structure 2, [[but]] besides the conductive protruding block 8. The key feature of the present invention [[,]] is that the conductive protruding block 8 is ~~made by the shaping unity~~ an unitary member with the first heat [[-]] dissipating ~~element~~ structure 2, and located on the backside of the first heat [[-]] dissipating ~~element~~ structure 2, or added ~~additional~~ on the backside of the first heat-dissipating ~~element~~ structure 2 ~~independently~~.

Please amend the paragraph at Page 11 from line 2 as following:

~~Referring to~~ FIG. 5~~, which represents~~ depicts the structure of the ~~ball grid array~~ package device with modified embedded heat slug on the [[PC]] printed circuit board. The structure includes a ball grid array package substrate 20, a modified embedded heat slug 22 that located on the ball grid array package substrate 20, ~~wherein~~ and the modified embedded heat slug 22 having a cavity 24, which is used to reduce the thickness of the molding compound 26 when the molding compound is mold into the ball grid array package device. In addition, the plurality of ball 28 located below the ball grid array package substrate 20 to connect with the [[PC]] printed circuit board 12. Furthermore,

the [[PC]] printed circuit board 12 ~~have as~~ includes at least two holes 14 thereon to pass through the at least two conductive ~~pillars~~ supports 6.

Please replace Page 11 from lines 14 to 21 as following:

In another embodiment, when the printed circuit board 12 without holes 14 therein to provide the conductive support 6 to pass through, the conductive protruding block 8 can assemble with the cavity 24 of the heat slug without holes 14 within the printed circuit board 12. Also, the conductive material can be an adhesive material to adhere the first heat dissipating structure 2 and the ball grid array package device 22. ~~as shown in FIG. 5, for connecting with the molding compound 26 on the surface of the ball grid array package 22, and the conductive protruding block 8 is embedded into the cavity 24 of the heat slug on the ball grid array package 22 when the PC board 12 without holes 14 therein to provide the at least two conductive pillars 6 pass through. Further, the conductive material can use as an adhesive material to add there-between to adhere the first heat dissipating element 2 and the ball grid array package 22.~~

Please amend the paragraph at Page 11 from line 23 as following:

~~Referring to~~ FIG. 6~~, which represents~~ depicts the structure of the second ~~part of~~ heat sink assembly 1B. The second ~~part of~~ heat sink assembly 1B is a bottom plate, which has at least two ~~openings~~ through holes 34 on the sides and a protruding ~~portion~~ structure 32 of the central of the bottom plate 1B~~, wherein~~ [[at]] At least two ~~openings~~ through holes 34 used to join [[the]] at least

two conductive ~~pillars~~ supports 6, and the first ~~part of the~~ heat sink assembly 1A that is fixed with the second ~~part of the~~ heat sink assembly 1B by the groove 7 of the at least two conductive ~~pillars~~ supports 6 and the blot 36 of the ~~opening~~ through holes 34.

Please amend the paragraph at Page 12 from line 9 as following:

Furthermore, the protruding ~~portion~~ structure of the central 32 of the bottom plate 1B can contact with the backside of the [[PC]] printed circuit board 12, ~~such that~~ therefore, the heat can be removed from the bottom plate 1B~~, to the~~ through at least two conductive ~~pillars~~ supports 6, and the second heat dissipating ~~element~~ structure 4 to the outside. The advantage of the abovementioned description is that the dissipating space of backside of the [[PC]] printed circuit board 12 can be increased to improve the heat dissipating ~~effect~~ efficiency. Moreover, the second ~~part of~~ heat sink assembly 4 can use for the conventional BGA (ball grid array) package or TEBGA (thermal enhanced ball grid array) package without using conductive protruding block 8.

Please amend the paragraph at Page 12 from line 20 as following:

~~Referring to~~ FIG. 7~~, which~~ represents the conductive ~~pillars~~ supports 6 of the first heat[[-]]dissipating ~~element~~ structure 2 that passed through the holes 14 of the [[PC]] printed circuit board 12 to the backside of [[PC]] printed circuit board 12 to first heat dissipating ~~element~~ structure 2. According to the view of the mechanical design, [[the]] at least two conductive ~~pillars~~ supports 6 does not contact with the hole-wall of the holes 14, because there is a tolerance between [[the]] at

least two conductive ~~pillars~~ supports 6 and the hole-wall of the hole 14. Nevertheless, the objective of the present invention is to improve the heat ~~dissipation~~ dissipating efficiency, thus, after the grounded plane 12A is passed through by the conductive ~~pillars~~ supports 6, and the conductive material 42 is filled with the gap space between the hole-wall of holes 14 and [[the]] at least two conductive ~~pillars~~ supports 6.

Please amend the paragraph at Page 13 from line 9 as following:

Therefore, the heat can be removed from the grounded plane 12A of the [[PC]] printed circuit board 12 to [[the]] at ~~lest~~ least two conductive ~~pillars~~ supports 6, and [[is]] transferred to the first heat dissipating ~~element~~ structure 2. On the other hand, the heat can be removed from the [[BGA]] ball grid array package device [[to]] through the heat slug 22 of the [[BGA]] ball grid array package device to the second ~~part of the~~ heat sink assembly 1B to [[the]] at least two conductive ~~pillars~~ supports 6, and to the grounded plane 12A of the [[PC]] printed circuit board 12. Moreover, the heat sink assembly also can be used only with at ~~lest~~ least two conductive ~~pillars~~ supports 6, and at least two springs, but without the bottom plate 1B.

Please amend the paragraph at Page 13 from line 19 as following:

The key feature of the embodiment, the bottom plate 1B is made of the conductive material or metal, ~~such that~~ therefore, the bottom plate 1B can increase the heat ~~dissipation~~ dissipating efficiency for overall heat sink device. Furthermore, the second ~~part of~~ heat sink assembly 1B

further ~~comprises~~ includes at least two springs 40 that put around [[the]] at least two conductive ~~pillars~~ supports 6 to pull tight between the first ~~part of the~~ heat sink assembly 1A and the second ~~part of~~ heat sink assembly 1B.

Please amend the paragraph at Page 14 from line 3 as following:

FIG. 8 represents the cross-sectional view of the construction of the ~~ball grid array~~ package device with heat sink device 1. The heat would be generated from the chip or die during the computer is operated, thus the heat should be removed to reduce the operating temperature to keep the computer operating stability. The heat can be removed by the first path [[1]]. The first path [[1]] is that the heat is removed by introducing the heat to the heat slug 22 of [[BGA]] package device to the conductive protruding block 8, first heat [[-]] dissipating ~~element~~ structure 2, and second heat [[-]] dissipating ~~element~~ structure 4. On the other hand, the second path [[2]] is that the heat also can be removed from the backside of the [[PC]] printed circuit board 12 that passed through up to the conductive ~~pillars~~ supports 6 to the first ~~part of the~~ heat sink ~~assemblies~~ assembly 1A, or passed through down to the spring 40 to [[the]] at least two ~~opening~~ through holes 32 of the sides of the bottom plate 1B to the [[PC]] printed circuit board grounded layer 12A, or the heat also can be removed from the backside of the [[PC]] printed circuit board 12 [[to]] through the protruding [[part]] structure 32 of the bottom plate 1B to the [[PC]] printed circuit board grounded layer 12A.

Please amend the paragraph at Page 21 from line 5 as following:

The present invention provides the heat sink device for the ~~ball grid array~~ package device to improve the heat ~~dissipation dissipating~~ efficiency. The heat sink device includes a first ~~part of~~ heat sink assembly that ~~comprises~~ includes a heat dissipating ~~element~~ structure that located above the heat sink body and [[is]] used to increase the heat dissipating area. ~~, and at~~ At least two conductive ~~pillars~~ supports located on the backsides of the heat sink body, which [[is]] used to fix the heat sink assembly with [[PC]] printed circuit board and also ~~conducting~~ conduct the heat [[flux]] from thermal source to heat ~~dissipation element~~ dissipating structure.[[;]] [[a]] A conductive protruding block located on the backside of the heat sink body, wherein the conductive protruding block used to associate with the cavity of the ~~ball grid array~~ package device to increase the heat ~~conductivity~~ dissipating efficiency. In addition, the second ~~part of~~ the heat sink assembly ~~comprises~~ includes a bottom plate ~~that used~~ to contact with the backside of the [[PC]] printed circuit board, ~~so as~~ to increase the heat ~~dissipation~~ dissipating efficiency to remove the heat that is generated from the [[PC]] printed circuit board, and to join [[the]] at least two conductive ~~pillars~~ supports of the heat sink body to fix the heat sink assembly on the [[PC]] printed circuit board.